

and minimum temperatures, and average rainfall for the several cotton districts, for the month of June; the means for the same districts for June of the three preceding years are also given. A comparison of these figures shows a deficiency in the rainfall in all districts, except those of Charleston and Memphis. The means of the maximum and minimum temperatures are higher in nearly all of the districts but the departures in most of them are slight. The reports for the district of Galveston are missing.

Temperature and rainfall data for the cotton districts, June, 1885.

Districts.	Rainfall.			Temperature.								Extremes for June, 1885.	
	Average for June of three preceding years.	Average for June, 1885.	Departures.	Maximum.			Minimum.						
				Mean for June of three preceding years.	Mean for June, 1885.	Departures.	Mean for June of three preceding years.	Mean for June, 1885.	Departures.				
New Orleans.....	5.09	3.01	- 2.01	89.1	92.9	+ 2.8	70.8	69.4	- 1.4	105	94.0		
Savannah.....	5.33	4.15	- 1.17	88.9	91.2	+ 2.3	68.9	70.3	+ 1.4	103	95.4		
Charleston.....	5.35	6.60	+ 1.31	88.4	88.7	+ 0.3	67.1	67.2	+ 0.1	99	98.5		
Atlanta.....	5.38	3.90	- 1.38	86.6	89.3	+ 2.7	65.4	66.7	+ 1.3	101	91.5		
Wilmington.....	4.10	4.87	+ 0.23	87.7	87.0	- 0.1	65.1	64.2	- 0.9	97	91.4		
Memphis.....	4.24	4.70	+ 0.46	87.6	89.2	+ 1.6	65.5	67.6	+ 1.1	102	94.2		
Galveston.....	5.68			92.2			70.5						
Vicksburg.....	5.47	2.38	- 1.09	89.9	92.3	+ 2.4	68.3	68.5	+ 0.2	102	94.7		
Montgomery.....	5.22	3.47	- 1.75	88.7	91.7	+ 3.0	67.6	69.2	+ 1.6	103	95.8		
Augusta.....	5.22	4.24	+ 0.98	88.7	90.3	+ 1.6	66.7	67.0	+ 0.3	103	96.3		
Little Rock.....	4.78	2.71	- 0.67	89.6	90.1	+ 0.5	65.7	66.3	+ 0.6	103	95.4		
Mobile.....	4.48	2.59	- 1.79	91.7	92.1	+ 0.4	68.3	74.7	+ 6.4	103	96		

WINDS.

The most frequent directions of the wind during June, 1885, are shown on chart ii. by arrows flying with the wind. In the lower lake region, Tennessee, and the upper Ohio valley, the prevailing winds were from southwest and west; in the upper Missouri valley, northern and middle slopes, they were easterly and southeasterly; in the middle Atlantic and Gulf states, upper Mississippi, and the lower portions of the Ohio and Missouri valleys, they were southerly; on the California coast they were westerly, except at Cape Mendocino, where the prevailing direction was north; in other districts they were variable.

HIGH WINDS.

(In miles per hour.)

During the month of June velocities of fifty or more miles per hour were recorded at stations as follows:

On the summit of Mount Washington, New Hampshire, 78, nw., 1st; 63, nw., 2d; 69, nw., 6th; 60, w., 7th; 73, w., 8th; 85, nw., 9th; 69, w., 10th; 60, w., 13th; 100, w., 14th; 98, nw., 15th; 52, w., 16th; 67, nw., 17th; 67, nw., 18th; 50, s., 21st; 79, nw., 22d; 78, nw., 23d; 87, nw., 24th.

Pike's Peak, Colorado, 52, w., 4th; 62, sw., 5th; 78, w., 6th; 56, sw., 11th; 54, s., 13th; 60, w., 20th; 52, se., 21st.

Montrose, Colorado, 50, sw., 5th.

Fort Buford, Dakota, 56, ne., 6-7th.

Dodge City, Kansas, 52, se., 5th.

Fort Custer, Montana, 55, w., 6th.

Fort Maginnis, Montana, 54, n., 6th.

Fort Concho, Texas, 52, e., 30th.

Cheyenne, Wyoming, 50, s., 5th.

LOCAL STORMS AND TORNADOES.

Chicago, Illinois, 2d: between 5 and 6 p. m. a thunder-storm, accompanied by heavy rain, prevailed in this city and vicinity. Many buildings were struck by lightning during the storm. Another violent thunder-storm, with heavy rain, prevailed during the night of the 2-3d. Five persons are reported to have been killed by lightning.

Atchison, Kansas: a violent storm occurred at this place on the 3d. The rainfall was remarkably heavy and resulted in the overflow of all streams in this vicinity. The damage to property is estimated at \$60,000.

Paris, Edgar county, Illinois: a very violent storm occurred

here at about 7 p. m. on the 4th. Numerous buildings were unroofed, and large numbers of trees and telegraph poles were prostrated. A church was almost entirely demolished.

Olivet, Eaton county, Michigan: a very severe storm, lasting about one hour, began at about 6 p. m. on the 4th. The high wind and very heavy rainfall (about four inches) caused much damage to crops; cellars were flooded and fencing scattered.

Oil City, Pennsylvania: during the night of the 4-5th the heaviest rains experienced for many years fell in this vicinity. The track of the Lake Shore railroad was washed away in several places between this place and Stoneborough; on the Allegheny Valley railroad there were four washouts between Oil City and Franklin.

Pierre, Hughes county, Dakota: a storm of unusual severity occurred at this place at about 5 p. m. on the 5th. It was accompanied by hail and very heavy rain, the latter causing much damage by flooding cellars, while many windows were broken by the hail. At Forest City, Potter county, the storm was also very severe, the hail and heavy rain causing much damage.

Fort Bennett, Dakota: on the 5th a high wind set in at 3.45 p. m., and continued with increasing force until 10.38 p. m. The maximum hourly velocity of the wind, 44 miles, west, occurred about 8 p. m., but at 10.30, a sudden squall occurred, during which, for two or three minutes, the wind blew at the rate of 72 miles per hour. This squall blew down nearly all of the out-buildings and fencing at the post and Indian agency. The rainfall during the storm amounted to 1.58 inches, which is an unusually large amount for this place. The Missouri river rose six feet during the night of the 5-6th, and small streams in the vicinity overflowed.

Baltimore, Maryland: during the afternoon of the 5th a severe storm, lasting about twenty minutes, prevailed in this city. It began at about 2.45 p. m., and was confined to an area less than one mile in width and about five miles in length through the northeastern part of the city. In the central part of the city but slight damage was caused, but in the northern and eastern sections many buildings were unroofed or otherwise damaged. At Highlandtown, five miles east of the city, many dwellings were wrecked and one man was killed.

Chincoteague, Virginia: during the afternoon of the 5th a thunder-storm occurred at this place, and at 5.30 p. m. (after the thunder-storm) the wind suddenly increased from a velocity of twelve to forty miles per hour, and continued at that rate for fifteen minutes.

Richmond, Virginia: a severe storm passed over this city on the afternoon of the 5th. A number of houses were unroofed and trees were blown down. Reports from Petersburg state that the storm was unusually severe at that place and resulted in considerable damage.

Owatonna, Steele county, Minnesota: a severe wind and hail storm passed over this place on the 7th. The hail-stones, which were about the size of hens' eggs, fell in sufficient quantity to cover the ground. Trees and crops were badly damaged, and nearly all the sky-lights in the town were broken. The storm lasted about half an hour.

Utica, New York: at about 8.30 p. m. on the 7th a violent wind and hail storm prevailed in this vicinity. At 1.20 a. m. of the 8th another very severe storm passed over the city, moving from west to east. During the latter storm, which lasted about thirty minutes, buildings were unroofed and many light structures were demolished.

Woodstock, Shenandoah county, Virginia: at 6.45 p. m. on the 7th a violent wind and rain storm occurred at this place. The streets were flooded, buildings unroofed, and trees and fencing blown down. The damage at this place is estimated at \$10,000.

Dubuque, Iowa: during the night of the 7-8th a heavy rain and hail storm passed over this place; it moved in an easterly direction and lasted about thirty minutes. Several dwellings and about twenty barns were wrecked.

Peoria, Illinois: a violent storm is reported to have passed over Marshall county, in this state, during the night of the 7-8th, unroofing houses and blowing down trees, etc.

Deadwood, Dakota: at 2.28 p. m. on the 11th a tornado-cloud formed a short distance east of this station. It passed to the south of "White Rocks," over the divide, and into Spruce Gulch. The tornado was accompanied by a heavy fall of hail, the hail-stones measuring from one-fourth to two and one-half inches in diameter. After passing into Spruce Gulch the storm became more violent and levelled all trees in its path; a few buildings were blown down.

Council Bluffs, Iowa: a severe storm occurred here at 8 p. m. on the 12th. The Deaf and Dumb Asylum was unroofed and the building damaged to the extent of \$10,000.

Minneota, Lyon county, Minnesota: the storm which occurred in this vicinity on the 12th is reported to have passed through the following townships in Yellow Medicine county: Wergeland, Burton, Swede, Prairie, Normania, and Sannes; it also passed through the northern part of Westerheim valley and the town of Lucus, in Lyon county. Hail fell over a large part of the area visited by the storm, causing great damage to the growing crops. At Lucus about seven hundred acres of wheat were totally ruined. The losses sustained are estimated at more than \$100,000.

Sioux City, Iowa: during the night of the 12-13th a passenger train on the Sioux Falls Branch of the Chicago, Milwaukee, and Saint Paul railway was blown from the track by a tornado, and a number of persons were injured. During the night of the 14-15th a severe wind storm occurred at Sioux City, causing damage estimated at about \$10,000.

Pulaski, Davis county, Iowa: a tornado occurred here during the night of the 12-13th. The storm approached from the northwest and lasted about twenty minutes, destroying and unroofing buildings. Four persons are reported to have been killed.

Lexington, Missouri: during the night of the 13-14th this place was visited by a very heavy rain storm, which caused damage estimated at \$2,000.

The following is an extract from the New York "Journal of Commerce," of June 15, 1885:

SAN ANTONIO, TEXAS, June 14.—Information has been received here to-day from Salinas, Mexico, to the effect that a terrific cyclone recently visited that section, doing great damage to crops. About forty-five houses in the immediate track of the cyclone were demolished, leaving many families entirely destitute.

Omaha, Nebraska: a severe wind and hail storm occurred in this vicinity on the 14th, causing damage to barns and other buildings. Dispatches from points along the Union Pacific railroad report the occurrence of severe storms on this date. At Millard, twenty miles west of Omaha, considerable damage was done.

Stillwater, Minnesota: a severe wind and rain storm occurred about midnight of the 14-15th, causing damage estimated at \$20,000.

Dayton, Ohio: a destructive storm occurred in this vicinity during the evening of the 15th. Dwellings and other buildings in Middletown, Carlisle, Germantown, Miamisburg, and Carrollton were unroofed or otherwise damaged, and the bridge over the river at Miamisburg was partially wrecked.

Augusta, Georgia: considerable damage, such as blowing down trees, etc., was done in this vicinity by the storm on the afternoon of the 16th.

Beloit, Rock county, Wisconsin: during the early morning of the 16th a tornado occurred ten miles northwest of this place; no serious damage was done.

Idaho City, Idaho: a severe storm occurred at this place at about 3 p. m. on the 19th; several buildings were damaged; the storm was of from fifteen to twenty minutes duration.

Boisé City, Idaho: between 5 and 6 p. m. on the 19th a thunder-storm prevailed, during which the wind reached a velocity of 30 miles per hour; a light fall of hail accompanied the storm; many trees in this vicinity were blown down. At points

to the northeast and southeast hail is reported to have fallen to a depth of four inches.

Brownsville, Saline county, Missouri: reports state that a tornado occurred about five miles east of this place during the evening of the 20th. Several buildings and much fencing were demolished.

Breckenridge, Caldwell county, Missouri: at 11.15 p. m. on the 20th a tornado demolished several dwellings and blew down many trees at this place. The storm lasted about thirty minutes and is considered the severest ever experienced here.

Macon City, Macon county, Missouri: a tornado occurred two miles south of this place during the night of the 20-21st, causing much damage. Several buildings were destroyed and many trees prostrated.

Chillicothe, Livingston county, Missouri: the storm during the night of the 20-21st caused damage at this place to the extent of from \$15,000 to \$20,000.

Centralia, Boone county, Missouri: from 2.15 to 4 a. m. on the 21st a violent storm prevailed at this place. About fifty out-buildings in this vicinity were blown down, together with a large number of trees and much fencing.

Saint Clairsville, Belmont county, Ohio: a destructive storm passed over a strip of country about one mile wide by five miles in length, near Hendrysburg, in this county, during the evening of the 22d. The course of the storm was from southwest to northeast, and buildings, trees, and crops within its path were destroyed. In some instances trees two feet in diameter were broken off close to the ground and carried long distances. This storm is considered the severest ever before experienced in this vicinity.

Penn Yan, Yates county, New York: nearly four inches of rain fell in less than two hours on the morning of the 23d. This was one of the most sudden and violent rain storms ever experienced here, and resulted in much damage to buildings, fences, and crops.

Galveston, Texas: a very violent thunder-storm prevailed here during the early morning of the 24th; it moved from west to east, and was most severe between 2 and 3 a. m. Several buildings were struck by lightning during the storm.

Memphis, Tennessee: light sprinkles of rain fell at intervals during the afternoon of the 25th, but the amount was inappreciable at this station, while between 5.30 and 6 p. m. a remarkably heavy fall of rain (more than two inches) occurred about two and one-fourth miles east of the city.

Pipe Stone, Pipe Stone county, Minnesota: a severe storm of rain and hail occurred during the early morning the 26th. In this vicinity and in the surrounding country much damage was done to crops and buildings.

Baltimore, Maryland: between 2.50 and 10.15 a. m. on the 28th the heaviest rainfall occurred that has been recorded since the establishment of the signal office in this city. About four and one-half inches of rain fell during the storm, causing great damage in that part of the city bordering on Jones' Falls. Several streets were inundated to a depth of four feet.

The following are reports of tornadoes for June, 1885, made by special tornado observers, of whom there are more than 1,300:

2d.—A tornado occurred five miles south of Graham, Nodaway county, Missouri, at 7 p. m. The cloud was funnel shaped. But little damage was done.

3d.—A tornado occurred fifteen miles west of Graham, Nodaway county, Missouri, at 6.45 p. m. There were two funnel-shaped clouds moving eastward, in parallel tracks, about three miles apart. The length of the path was forty miles. In the southern track eight persons were injured, and nine houses and one school house destroyed.

5th.—A tornado occurred at Summer Hill, Douglas county, Nebraska, at 7 p. m. The cloud was balloon shaped. The track was nine hundred feet wide. No persons were injured. One brick dwelling, a large frame dwelling, a windmill, several stables and out-buildings were destroyed.

7th.—A tornado occurred at New Albion, Allamakee county,

Iowa, at 1 p. m., moving E. 20° S. Four persons were injured. A railroad elevator, school house, seven residences, and several barns were totally destroyed, and twenty houses unroofed. The damage is estimated at \$50,000.

7th.—A tornado occurred at Junction City, Boyle county Kentucky, at 3 p. m., moving in a northeasterly direction. The cloud was funnel shaped. The path was 2,400 feet wide. No persons were killed. Some houses and out-buildings were destroyed.

12th.—A tornado occurred six miles south of Sargent, Custer county, Nebraska. Three persons and two horses were killed by lightning. Several houses were destroyed.

12th.—A tornado occurred at Wessington Springs, Jerauld county, Dakota. A small funnel-shaped cloud formed a little north of west of the town at 5.25 p. m., and moved in a south-westerly direction; no damage was done.

12th.—A number of small tornadoes occurred at various places in the state of Iowa:

At Bridgewater, Cass county, two persons were fatally, and several slightly, injured. Five dwellings, a broom factory, and a drug store were destroyed, and a large number of houses damaged; losses estimated at \$60,000.

In the southeastern part of Davis county three persons were killed and four injured, and two houses destroyed.

In Lakeport township, Woodbury county, about \$1,000 worth of timber was destroyed.

At Sloan, Woodbury county, the tornado occurred at 7.30 p. m.; fifteen persons were injured; three dwellings and some out-buildings destroyed.

Near Sully, Jasper county, the cloud appeared at 3 p. m., was funnel shaped and moved eastward; four persons were injured, two horses killed, one dwelling, one stable, and two barns destroyed.

A funnel-shaped cloud was observed nine miles northwest of Sioux City, Woodbury county, at 6.48 p. m.; twenty persons were injured. A passenger train was struck by the cloud, and three coaches and baggage car thrown from the track and badly damaged.

19th.—A tornado occurred at Cleveland, Kingman county, Kansas, at 1 a. m., moving southeast. The cloud was funnel shaped. One person badly, and several slightly, injured. Nine dwellings and two stables entirely destroyed and much damage to other property.

20th.—A tornado occurred at Seward, Stafford county, Kansas, in the afternoon, moving southeast. The cloud was funnel shaped. The path was 3,960 feet in width and twelve miles in length. Two horses and several head of cattle were killed. Eight persons were injured. Eight dwellings, two stables, and some out-buildings destroyed.

20th.—A tornado occurred at Sibley, Jackson county, Missouri, at 10 p. m., moving northeast. It is reported to have whirled contrary to the hands of a watch. The path was 1,200 feet wide. A large store was destroyed.

20th.—A tornado occurred near Leavenworth, Kansas, at night. Five persons were injured in one house; three horses killed and nine injured; one barn was blown to pieces; one dwelling was destroyed and the occupants thrown about in all directions; the second story was blown from another dwelling.

21st.—A tornado occurred at Ravenna, Portage county, Ohio, at 7.45 p. m., passing N. 25° E. The cloud was funnel shaped, whirled contrary to the hands of a watch, and was about one minute in passing a place. The path was five hundred feet wide and four miles long; two persons were injured. Four barns and one dwelling destroyed, and fifteen business blocks unroofed. Damage amounted to \$50,000.

21st.—A tornado occurred at Glasgow, Howard county, Missouri, at fifteen minutes past midnight. The cloud was funnel shaped; five buildings were destroyed and twelve unroofed; one man was killed and another seriously injured.

22d.—A tornado occurred at Friendship, Allegheny county, New York at 2.20 a. m., moving northeast. The cloud was funnel shaped and whirled contrary to the hands of a watch.

The path was five hundred feet wide; some buildings were unroofed and barns blown down.

27th.—A tornado occurred seven miles north of Nebraska City, Nebraska, at 1.40 p. m., moving northeast. The cloud was "serpent" shaped.

NAVIGATION.

STAGE OF WATER IN RIVERS.

In the following table are shown the danger-points at the various river stations; the highest and lowest stages for June, 1885, with dates of occurrence, and the monthly ranges:

Heights of rivers above low-water mark, June, 1885.

[Expressed in feet and tenths.]

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Red river:</i>						
Shreveport, Louisiana.....	29 9	1, 2	22 2	25	16 5	5 7
<i>Arkansas river:</i>						
Fort Smith, Arkansas.....	15 0	26, 28	17 1	10	7 3	9 8
Little Rock, Arkansas.....	23 0	29	17 5	13	9 0	8 5
<i>Missouri river:</i>						
Yankton, Dakota.....	24 0	15	20 5	6	12 9	7 6
Omaha, Nebraska.....	18 0	17	16 6	3	9 4	7 2
Leavenworth, Kansas.....	20 0	19	17 9	1, 4	12 3	5 6
<i>Mississippi river:</i>						
Saint Paul, Minnesota.....	14 5	18, 19	7 4	12	4 4	3 0
La Crosse, Wisconsin.....	24 0	26, 27, 28	9 1	12, 14	6 4	2 7
Dubuque, Iowa.....	16 0	1	10 2	19	6 9	3 3
Davenport, Iowa.....	15 0	1, 2, 3, 6, 7	7 8	23, 24, 25	5 4	2 4
Keokuk, Iowa.....	14 0	13	12 3	30	7 0	5 3
Saint Louis, Missouri.....	32 0	17	27 0	4	18 8	8 2
Cairo, Illinois.....	40 0	22	30 8	15	25 5	5 3
Memphis, Tennessee.....	34 0	23 to 27	23 4	1	14 8	8 6
Vicksburg, Mississippi.....	41 0	31	33 1	5	27 2	5 9
New Orleans, Louisiana*.....	-3 0	1	-4 2	25, 26	-5 3	1 1
<i>Ohio river:</i>						
Pittsburg, Pennsylvania.....	22 0	6	9 9	30	1 6	8 3
Cincinnati, Ohio.....	50 0	2	22 5	24	9 3	13 2
Louisville, Kentucky.....	25 0	2 to 5	9 2	25, 26	5 5	3 7
<i>Cumberland river:</i>						
Nashville, Tennessee.....	40 0	3	27.8	29	3 3	24 5
<i>Tennessee river:</i>						
Chattanooga, Tennessee.....	33 0	1	18 6	27	3 4	15 2
<i>Monongahela river:</i>						
Pittsburg, Pennsylvania.....	29 0	6	9 9	30	1 6	8 3
<i>Savannah river:</i>						
Augusta, Georgia.....	32 0	11	14 8	24	6 4	8 4
<i>Mobile river:</i>						
Mobile, Alabama.....		5	18 5	22	15 4	3 1
<i>Sacramento river:</i>						
Red Bluff, California.....		10 to 19	1 0	1 to 5	0 8	0 2
Sacramento, California.....		1, 2, 3	11 0	29, 30	9 0	2 0
<i>Willamette river:</i>						
Portland, Oregon.....		23, 24	14 5	1	11 7	2 8
<i>Colorado river:</i>						
Yuma, Arizona.....		13	24 8	24	21 5	3 3

* Below high-water mark of 1874 and 1883. † Record for last 25 days of the month.

HIGH TIDES.

New London, Connecticut, 7th: the tide rose to a height of two feet above the normal high tide, and flooded cellars.

Eastport, Maine, 15th.

Smithville, North Carolina, 14th.

FLOODS.

Petersburg, Virginia: on the 2d reports from the surrounding counties stated that in consequence of the recent heavy rains all streams were much swollen, and that a number of small bridges were washed away. The river at Petersburg reached the highest point known for a long time, and the recently-built city reservoir overflowed.

Pittsburg, Pennsylvania: between 8 and 10 p. m. on the 4th a remarkably heavy rainfall occurred in the northeastern part of Allegheny City, and at Wood's Run. At the latter place the rainfall is estimated at not less than ten inches. This very heavy fall of rain caused a rise of seven feet in the Allegheny river at Wood's Run in about fifteen minutes, and resulted in flooding the cellars of many buildings; in some instances the floors of the first stories were covered. A number of calves, sheep and hogs were drowned.

Cleveland, Ohio: the heavy rain on the 4th caused numerous washouts in this city. The Cleveland and Pittsburg railroad track near Woodlawn avenue was washed out for a distance of one hundred and fifty feet.